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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

#31

Applicant : M. ARONHIME, et al.

Group Art Unit 1774

Serial No : 09/011,634

Examiner Grendzynski

1-8-03

Filed : April 3, 1998

For :INTERMEDIATE TRANSFER BLANKET AND METHODS OF PRODUCING THE SAME

SECOND DECLARATION OF MARC ARONHIME UNDER 37 CFR 1.132

Commissioner of Patents and Trademarks
Washington, D.C. 20231

Sir:

I, Marc ARONHIME, declare as follows:

1. I am very familiar with polymer materials. I hold an M. A. and a Ph.D. in Chemical Engineering from Princeton University. I have been working in polymer chemistry since 1985 and in research and development connected with liquid toner imaging since 1994. I am employed by Indigo Ltd., an Israel research and development company specializing in liquid toner imaging systems as Manager of Polymers and Elastomers Imaging Products R&D.

2. I am the same Marc ARONHIME who filed a declaration with respect to the above referenced application on November 7, 2001. I confirm the contents of that declaration.

3. I have reviewed the disclosure of US Patent Application Serial Number 09/011,634. I am familiar with the invention disclosed therein, being the first named inventor.

4. In the representative examples described in the specification of the present application at page 21, line 21 to page 24, line 22, the outer layer of the blanket is produced from a mixture of silicone materials with or without additional additives. The composition of the outer layer determines the tackiness of the blanket. As disclosed, tackifiers are not used in the production of this layer, or at least not in amounts that would make the blanket tacky. The disclosure of the application also moots the possibility of adding up to 10% of silicone oils to the pre-cured mixture.

5. As described in the specification, solid fillers present in the commercial condensation curing silicon rubber formulations used are removed from the formulations. The amounts of solid fillers present in the formulations as received is around 20%. The viscosity of the formulations is between 11,000 and 39,000 cps (according to the specification of the materials). After removal of the solid fillers, as disclosed in the specification, the viscosity is in the range of 1,000-4,000 cps.

6. I believe that solid fillers are added, *inter alia* in order to increase the strength of the cured polymer and/or to decrease the cost. In our formulations, as described in the specification, the fillers are removed. This increases the gloss of images transferred by the intermediate transfer member.

7. I have produced intermediate transfer blankets using the methods described in the above referenced application and have used such blankets in liquid toner imaging. I have also produced intermediate transfer blanket materials having added silicone oils in amounts of 2%, 5% and 10% for di-methylsilicone oils having a viscosity of 1,000 and 10,000 cps. A sample of each of these intermediate transfer blankets is provided herewith as is a control sample with no added silicone oil.

8. Under normal conditions of operation of the blankets, i.e., at room temperature and at the temperatures normally encountered in liquid toner imaging and when used to transfer liquid toner images from a photoreceptor to a final substrate, the surface of the blanket is not tacky for any of the blankets produced.

9. The liquid toner imaging systems described in the above referenced disclosure are designed to operate with a non-tacky blanket and tackiness of the blanket would result in poor transfer from the blanket to a further substrate.

10. I have reviewed the translation of JP publication 55-94449 and find several references to the use of silicone oil. Some of these references refer to the use of such oil, with a viscosity of 10,000 cps *or more* and preferably having a viscosity higher than that of the base oil (liquid raw rubber), as a *tackifier*. These references can be found at paragraph d) of the claim and in the *first* paragraph of page 14. Typical examples are methylsilicone oil and methylphenysilicone oil. The reference describes (in the second full paragraph of page 15) the use of 2-98% tackifier in the coating. However, there is no statement as to what percentages of silicone oil is used as a tackifier.

11. Furthermore, none of the examples utilizes silicone oil as a tackifier. It appears that silicone oil is one of a plurality of materials for use with additive cured silicone. Condensation cured silicone is another type of tackifier for use with additive cured silicone. However, there does not appear to be any suggestion of using silicone oil together with condensation cured silicone.

12. Other references relate to the use of silicone oil in an amount under 40% as being used "in combination as an adjusting agent *in order to improve durability.*

13. I have reviewed the statements of the Examiner made in the Examiner's action mailed on July 25, 2002. In particular, I have reviewed the Examiner's statement in sections 3 and 8 of the DETAILED ACTION. The Examiner does not appear to differentiate between the two types of silicone oil.

14. The Examiners statement that silicone oil is a known tackifier is not consistent with my experiments, at least when the amounts of oil used are under 10%. As indicated above, the experiments include the use of a low viscosity silicone oil and of a high viscosity oil having a 10,000 cps viscosity, which is much higher than the viscosity of the base oil used (1,000-4,000 cps). According to my experiments, when used in the amounts specified in the present application, no noticeable difference in tackiness is present for any of the samples as compared with the control (no silicone oil).

15. Furthermore, in section 8, the Examiner's position in the first paragraph thereof is rendered moot by the specification of the present application itself. Using any of the combinations defined in the specification will result in non-tacky intermediate members.

16. As to the second paragraph of section 8, it is well known to practitioners of the art that for every polymer material, a "normal amount" of catalyst (curing agent) is used. Determining this amount requires no experimentation at all since for all commercially available materials, the "normal amount" is clearly stated by the manufacturer.

17. As support of this fact, a copy of the specification/instructions for use, for RTV 41 and RTV 11, which are the materials mentioned in the specification as being condensation cured. On page 3, curing agents and amounts to be used are listed.

The undersigned declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements are made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under section 1001

of title 18 of the United States Code and such willful false statements may jeopardize the validity of any patent issuing thereon.

Date: Dec. 18, 2002

Marc ARONHIME

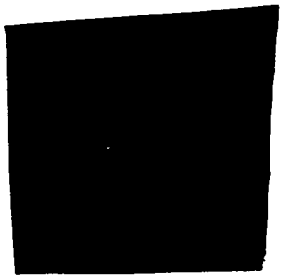
Second Declaration of Mark Aronhime- Examples of blanket materials

No added Silicone oil:

Silicone oil-Viscosity 1,000 cps

2% added Silicone Oil

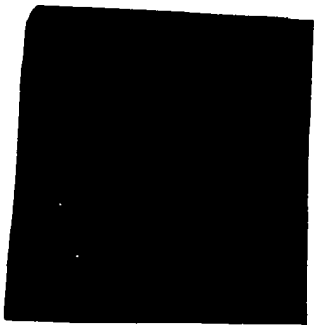
5% Added Silicone Oil



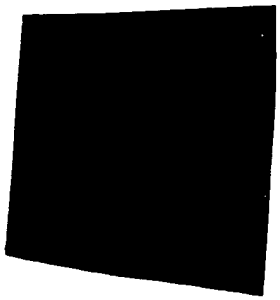
10% added Siicone Oil

Silicone oil-Viscosity 10,000 cps

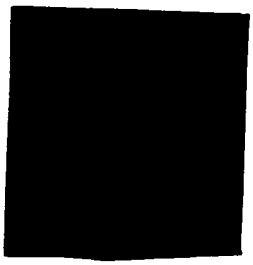
2% added Silicone Oil



5% Added Silicone Oil



10% added Siicone Oil



GE Silicones

RTV41

RTV11, RTV21, RTV41 - General Purpose Silicone Rubber Compounds

Product Description

RTV11, RTV21 and RTV41 silicone rubber compounds are general purpose two-part silicone elastomers. They are supplied ready-to-use with a base compound and DBT (dibutyl tin dilaurate) as the standard curing agent. DBT is suitable for most applications, however other catalysts are available to facilitate deep section cure, faster cure and automated mixing.

These silicone rubber compounds are similar in physical properties except for viscosity and color:

Grade	Color	Typical Viscosity
RTV11	white	11,000 cps
RTV21	pink	26,000 cps
RTV41	white	39,000 cps

Key Performance Properties

- Work time and cure rates can be varied
- Room temperature curel Composition free of solvents and solvent odor
- FDA compliance - RTV11 and RTV41 silicone rubber compounds can be used in food contact applications other than contact with acidic foods where FDA regulations apply. Refer to GE publication (4319) for additional information.
- Excellent adhesion capabilities with primer
- Excellent release properties
- Retention of elastomeric properties at temperatures from -54°C (-65°F) up to 204°C (400°F) continuously, and up to 260°C (500°F) for short periods of time.

Applications

Typical applications include, but are not limited to:

- Potting and encapsulating electrical coils and connectors
- Making cast-in-place gaskets and molds
- Release applications such as providing a surface on metals and fabrics from which paint and adhesives can be easily stripped

Typical Product Data

UNCURED PROPERTIES OF RTV BASE COMPOUNDS

	RTV11	RTV21	RTV41
Color	White	Pink	White
Consistency	Easily Pourable	Pourable	Pourable
Viscosity, cps	11,000	26,000	39,000

Specific Gravity	1.19	1.32	1.31

UNCURED PROPERTIES OF RTV BASE COMPOUNDS WITH 0.5% DBT CURING AGENT ADDED

	RTV11	RTV21	RTV41
Work Time @ 25°C (77F), hrs	1.5	1	1
Cure Time @ 25°C (77F), hrs	24	24	24

Typical Product Data

CURED PROPERTIES
(0.5 wt. % DBT Curing Agent added, cured 7 days @ 25C (77F) and 50% R.H.)

	RTV11	RTV21	RTV41
Mechanical			
Hardness, Shore A Durometer	41	45	47
Tensile Strength, kg/cm^2 (psi)	36 (510)	22 (310)	36 (520)
Elongation, %	190	210	190
Tear Strength, kg/cm (lb/in)	3.5 (20)	7.1 (40)	5.2 (29)
Shrinkage, %	0.6	0.6	0.6
Electrical			
Dielectric Strength, kv/mm (v/mil) (1.9 mm thick)	20.3 (515)	16.5 (420)	20.3 (520)
Dielectric Constant @ 1000 Hz	3.3	3.8	3.7
Dissipation Factor @ 1000 Hz	0.006	0.02	0.007
Volume Resistivity, ohm-cm	1.1×10^{15}	2.6×10^{14}	1.6×10^{14}
Thermal			
Useful Temperature Range, °C (°F)	-54 to 204 (-65 to 400)	-54 to 204 (-65 to 400)	-54 to 204 (-65 to 400)
gm-cal/sec, cm^2, °C/cm (BTU/hr, ft2, °F/ft)	0.00070 (0.17)	0.00074 (0.18)	0.00074 (0.18)
Coefficient of Expansion, cm/cm, °C (in/in, °F)	25×10^{-5} (14×10^{-5})	20×10^{-5} (11×10^{-5})	20×10^{-5} (11×10^{-5})
Specific Heat, cal/gm, °C	0.35	0.35	0.35
(BTU/lb, °F)	(0.35)	(0.35)	(0.35)

Specifications

Typical product data values should not be used as specifications. Specification assistance available by contacting GE Silicones at 800/255-8886.

AGENCY STATUS

RTV11 and RTV41 silicone rubber compounds may be used in food contact application other than acidic foods where FDA regulations apply.

Instructions for Use

Mixing

Select a mixing container 4 to 5 times larger than the volume of RTV silicone rubber compound to be used. Weigh out the RTV silicone rubber base compound and add the appropriate amount of curing agent. 0.5% DBT by weight will provide a work time or pot life of about one hour and a cure time of 24 hours. 0.5% DBT is the most commonly used concentration of curing agent for RTV11,

RTV21 and RTV41 silicone rubber compounds. The pot life may be lengthened by using less DBT (as little as 0.1%).

MEASURING GUIDE FOR CURING AGENT ADDITION

RTV Weight	Dibutyl Tin Dilaurate Concentration	
	0.1%	0.5%
100 grams	5 drops	25 drops
454 grams (1 lb.)	23 drops	115 drops (2.27 grams)

With clean tools, thoroughly mix the RTV base compound and the curing agent, scraping the sides and bottom of the container carefully to produce a homogeneous mixture. When using power mixers, avoid excessive speeds which could entrap large amounts of air or cause overheating of the mixture, resulting in shorter pot life.

Deaeration

Air entrapped during mixing should be removed to eliminate voids in the cured product. Expose the mixed material to a vacuum of about 25 mm (29 in.) of mercury. The material will expand, crest, and recede to about the original level as the bubbles break. Degassing is usually complete about two minutes after frothing ceases. When using the RTV silicone rubber compound for potting, a deaeration step may be necessary after pouring to avoid capturing air in complex assemblies.

Curing

Using DBT curing agent at a level of 0.5%, these RTV silicone rubber compounds will cure in 24 hours at 25°C (77°F) and 50% relative humidity to form durable, resilient rubbers. Under these conditions a pot life of about one hour will typically be available for pouring and working with the catalyzed material. Pot life may be increased by refrigerating the mixed material at 0°C (32°F) after catalyzing. Cure times may be shortened by using mild heat up to 93°C (200°F) maximum.

A choice of curing agents is available for use with RTV11, RTV21 and RTV41 silicone rubber compounds.

Curing Agent	Cure Speed	Curing Agent Concentration	Features
DBT	moderate	0.1-0.5%	standard
STO	fast	0.1-0.5%	small volume applications
RTV9811	moderate	5-10%	good deep section cure suitable for automatic mixing
RTV9950	moderate	5-10%	suitable for automatic mixing
RTV9910	slow	10%	suitable for automatic mixing

Deep Section Cure

If these RTV silicone rubber compounds are to be used in deep sections at temperatures over 150°C (302°F), the cured product should be properly conditioned prior to service. Following room temperature cure of 1-3 days, a typical program would be eight hours at 50°C intervals from 100°C (212°F) to the service temperature. Longer times at each temperature will be required for larger parts or very deep sections.

Bonding

If adhesion is an important application requirement, RTV11, RTV21 and RTV41 silicone rubber compounds require a primer to bond to non-silicone surfaces. Thoroughly clean the substrate with a non-oily solvent such as naphtha or methyl ethyl ketone (MEK) and let dry. Then apply a uniform thin film of a suitable silicone primer such as SS4004. Allow the primer to air dry for one hour or more. Finally, apply freshly catalyzed RTV silicone rubber compound to the primed surface and cure as recommended. For more details on priming and adhesion refer to GE Silicones data sheet on silicone primers (CDS1873).

Handling and Safety Material Safety Data Sheets are available upon request from GE Silicones. Similar information for solvents and other chemicals used with GE products should be obtained from your suppliers. When solvents are used, proper safety precautions must be observed.

Storage and Warranty Period These products may be shipped at ambient temperature up to 110°F for 7 days maximum. They must be stored at -18°C (0°F) or below.The warranty period is 12 months from the date of shipment from GE Silicones if stored in the original, unopened container at these conditions.

Availability RTV11, RTV21 and RTV41 silicone rubber compounds may be ordered from GE Silicones, Waterford, NY, 12188, the GE Silicones sales office nearest you or an authorized GE silicone product distributor.

Government Requirement Prior to considering use of a GE Silicones product in fulfilling any Government requirement, please contact the Government and Trade Compliance office at 413-448-4624.

CDS1867

material, product, service or design in the infringement of any patent or other intellectual property right.